NOTES ON SOME INDIAN TERRITORY LAND AND FRESH-WATER SHELLS.

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The shells upon which the following notes are based were collected by the writer during a brief visit to the eastern portion of the Territory in the spring of 1888.. On account of business, but a small portion of the two weeks I was in the "Nation" was spent in collecting. The reason for finding so few fresh-water species was the excessive amount of rain that fell just at the time of my arrival, which so raised the streams and ponds that for the most part I could obtain nothing.

Several very dry seasons had occurred previous to my visit, and as forest and prairie fires had raged with great violence I found in many places, and of several species, only dead shells. Most of the species enumerated have passed under the hands of Drs. Dall and Stearns of the U. S. National Museum, and I give the names of such just as they were given by them.

Helix (Triodopsis) copei Wetherby.

Under sandstone rocks; mountains near McAllister. Mostly dead, having been destroyed by forest fires.

? Helix (Triodopsis) vultuosa Gould.

Near Eufaula. A few specimens. Possibly a form of *H. copei*, as the two species seem to be quite close.

? Helix (Triodopsis) inflecta Say.

Abundant at Fort Gibson, Limestone Gap, and Eufaula.

Helix (Patula) alternata Say.

Fort Gibson. The strongly ribbed variety.

Helix (Polygyra) jacksoni Bland.

On limestone mountains near Fort Gibson. Very abundant. Limestone Gap, a few specimens. Several thousand shells of this species were found, and, with a half dozen exceptions, were much larger than the measurements given in Binney's Manual of American Land Shells. The greater diameter averaged 10, lesser 9^{mm}; height 5^{mm}. A few specimens were found in and near Fort Gibson measuring 7^{mm} greater diameter.

A form was found abundantly near Fort Gibson which differs remarkably from the type. Instead of the bicrural tooth on the body whorl at the aperture there is a heavy elevated deltoid callus, which is joined to the upper and lower margins of the peristome, and which occupies about the same area as the tooth in the type. The number of whorls is 5; greater diameter 7, lesser 6^{mm}; height, 3^{mm}. In examining

several hundred specimens, I have found none which approach the type, and I would therefore propose for it the varietal name of *deltoidea*.

Helix (Polygyra) dorfeuilliana Lea.

Fort Gibson; Limestone Gap; Eufaula. Abundant and variable in size.

Helix (Polygyra) triodontoides Bland.

A few dead specimens were found at Eufaula and near Kiowa. This species seems to me like a somewhat elevated and thinner form of *P. texasiana*.

Helix (Polygyra) texasiana Moricand.

Two or three dead and bleached shells were found near Eufaula.

Helix (Polygyra) leporina Gould.

Fort Gibson; Eufaula; Limestone Gap. Not abundant. Some of the specimens of this species strikingly resemble the Stenotremas, and I have received specimens from Texas, from an excellent American conchologist, labeled "*Stenotrema hirsuta*, small variety."

Helix (Stenotrema) monodon Rackett.

Rather plentiful near Limestone Gap and Eufaula. A form of this was found at the former place with spire greatly elevated, resembling *S. edwardsi*.

Helix (Stenotrema) stenotrema Ferussac.

Fort Gibson.

Helix (Mesodon) albolabris Say.

Fort Gibson; Limestone Gap.

Helix (Mesodon) elevata Say.

Near Fort Gibson.

Helix (Mesodon) thyroides Say.

Near Fort Gibson. The form *H. bucculenta*, with many variations, was found with the type. Some of these with a parietal tooth and others without; a number of them very closely approaching *Mesodon clausa* in size and appearance.

Helix (Mesodon) divesta Gould.

A few specimens at Fort Gibson. Abundant, mostly dead, near Eufaula and at Limestone Gap. Quite variable in size, ranging from 15^{mm} to 20^{mm} in diameter.

Helix (Mesodon) kiowaënsis n. s.

Shell umbilicated, orbicularly depressed, solid, dark-brown in color; whorls 5, with numerous rather coarse striæ, and fine revolving impressed lines, which are much more conspicuous on the last whorl. Suture deeply impressed, leaving the whorls well rounded; aperture oblique, somewhat transversely rounded, forming fully three-fourths of a circle; peristome thick and solid, white or purplish, evenly reflected

with a slight constriction behind it; umbilicus moderate, deep, exhibiting but little more than one of the whorls. Greater diameter 15, lesser 13mm; height, 7mm. Kiowa Station, about thirty specimens, mostly dead. Limestone Gap, two dead specimens. Another badly bleached shell was obtained not far from Eufaula.

Dr. R. E. C. Stearns considers this as a close ally of some of the smaller forms of *M. thyroides*. It seems to me to be more nearly related to *M. sayi*. Its wider umbilicus, more transverse aperture, solider texture, and less elevation distinguish it from *thyroides;* it is more depressed and has a more transverse aperture and narrower umbilicus than any forms of *sayi* I have seen, and its soft parts differ essentially from those of either. According to Mr. Pilsbry the jaw has 9 ribs (*sayi* having 13 to 16 and *thyroides* 13), the teeth have fewer laterals than *sayi*, and the inner cusp is bifid on the marginals, while in *sayi* it is entire.

Helicodiscus fimbriatus Wetherby.

A small variety wanting the epidermal fringe, and nearly destitute of the revolving ridges described by its author. Thousands of specimens were found, mostly dead, under slabs of sandstone on the mountains near Fort Gibson, and a few were taken at Limestone Gap. So far as I know, this is an entirely new locality for this species, as it has been credited heretofore only to the Cumberland subregion. I believe that a careful search throughout the Ozark Mountains and northern Texas will discover most of the species that have hitherto been supposed to belong only to the Appalachian chain. Most of the specimens found measured only from 3 to 4 mm in diameter.

Helicodiscus lineatus Say.

Fort Gibson; Limestone Gap.

Selenites concava Say.

Fort Gibson, a few shells.

Zonites friabilis W. G. Binney.

Abundant on limestone mountains near Fort Gibson and Tahlequah, and remarkably dark colored.

Zonites ligerus Say.

Fort Gibson.

Zonites acerra Lewis.

Low wet woods, Fort Gibson, with *Zonites ligerus*, *Triodopsis inflecta*, and the ribbed variety of *Patula attenuata*. Binney makes this merely a variety of *Zonites demissus*, but unless there are forms that connect the two it seems to me to be as distinct as most of the species of *Zonites*.

Zonites arboreus Say.

Eufaula.

Zonites radiatulus Alder.

Limestone Gap.

Zonites nitidus Müller.

A specimen of this species, somewhat smaller than the type, was found at Limestone Gap.

Zonites placentula Shuttleworth.

Fort Gibson, two or three shells.

Zonites capsella Gould.

A number of specimens were found at Limestone Gap, which Messrs. Dall and Stearns pronounce this species. The base is greatly flattened, as well as the upper part of the last whorl, giving the aperture a remarkably triangular form, quite different from any figures or specimens of *capsella* I have seen. One or two specimens of the typical *capsella*, were found with the above.

Helix (Strobila) labyrinthica Say.

Limestone Gap.

Pupa armifera Say.

Eufaula.

Pupa rupicola Say.

Fort Gibson.

Bulimulus dealbatus Say.

Fort Gibson, on limestone mountains; Limestone Gap. Abundant in both localities. I have no hesitation in saying that I believe *Bulimulus dealbatus* (Say), *B. schiedeanus* (Pfr.), and var. *Mooreanus* (Pfr.), and *B. alternatus* (Say) are merely varying forms of one and the same species. There is not a character given in the figures or descriptions of these shells that holds good when an extensive series from different localities is examined. I have before me several hundreds of specimens from Tennessee, Indian Territory, Kentucky, Texas, and Mexico, and I know whereof I speak. Say states that "the labrum of *alternatus* is white within, with a perlaceous tinge." W. G. Binney says that "the aperture is always dark; that it is readily distinguished from the allied forms by its greater solidity, its highly polished surface, its more elongated form, its dark-colored aperture bordered with the white internal margin of the peristome, and the tooth like callus upon the upper portion of the columella." (Manual of American Land Shells, page 371.) In a suite of sixty specimens from Derby and Laredo, Tex., there is a variation in the color of apertures and interiors from creamy white throughout through shades of light and dark brown to bluish black; there are shells with a greatly thickened rib on the inner submargin, a character that gradually fades out until specimens are found in which it is totally wanting; there is every possible variation of solidity, size, and form, as well as of comparative smoothness of exterior. Some of these might be considered forms of *dealbatus;* others perhaps would be referred to *alternatus* or *schiedeanus*, but many of them blend the characters of these so-called species in such a

manner that it is absolutely impossible to assign them to any species. The Derby specimens as a rule are smaller, less solid, and duller colored than those from Laredo, or from different points in Mexico. Specimens from Lee County, Texas, are very ventricose, rather thin, and covered with a loose, shaggy epidermis. Some of the Indian Territory shells show the tooth on the columella; in others it is wholly wanting. There are specimens in the lot from Derby having much the color of *schiedeanus* var. *mooreanus*, but which are longitudinally striped, and have dark purplish brown interiors. The variation in the length of specimens in my suite is from 16 to 33 mm, the larger specimens being from Mexico. I believe that the metropolis of this shell is Mexico, where it is larger, solider, smoother, and more highly colored than farther north; that in its northern limit—the Ozark and Cumberland Mountains—it is usually smaller, thinner, and less developed in every way than farther south. I will add that Dr. J. A. Singley, of Giddings, Tex., a man of much experience as a collector and a careful student, fully agrees with me in the above conclusions.

Succinea grosvenori Lea.

Fort Gibson, along a little stream in the town.

These shells agree perfectly with figure and description in Binney's Manual of American Land Shells, page 344, but I can not see that they differ essentially from *S. luteola* (Gould), which I found in great quantities in southern Florida and in western Nebraska. The western Nebraska shells are a trifle less inflated, and perhaps a little duller in color than those from Fort Gibson. The Succineas of the United States seem to be in a good deal of confusion and are troubled with a great many names, and when extensive suites from all over the country are carefully studied, I have no doubt that the number of so called species will be greatly reduced.

Helicina tropica Jan.

The form of *H. orbiculata* called by this name was found abundantly at Fort Gibson and near Stringtown.

Physa heterostropha Say.

McAllister; Fort Gibson.

Planorbis trivolvis Say

McAllister; Vinita.

Sphærium contractum Prime.

Pond at McAllister; Cabin Creek, Vinita.

Sphærium stamineum Conrad.

Cabin Creek, Vinita.

Unio camptodon Say.

Pond at McAllister.

Unio rutersvillensis Lea.

Pond at McAllister: Limestone Creek, at Limestone Gap. A small, dark, rough form, resembling somewhat *Unio texasensis*, was found in Cabin Creek, Vinita.

Unio luteolus Lea.

Limestone Creek.

Unio purpuratus Lamark.

Limestone Creek.

Unio parvus Say.

Cabin Creek.

Anodonta imbecillis Say.

Limestone Creek.

Anodonta dejecta Lewis.

Two specimens were found in Limestone Creek which are probably this.